AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1(Currently Amended). A peptide of the formula R^1-Asp-Lys-Gly-X-Y-Leu-Pro-Arg-Pro-Thr-Pro-Pro-Arg-Pro-Ile-Tyr-X'-Y'-R^2 SEQ ID NO: 1,

wherein said Thr is not glycosylated;

wherein R^1 is a moiety having a net positive charge;

wherein R^2 is selected from the group consisting of a free hydroxyl, an amide, an imide, a sugar, and a sequence of one or up to about 15 additional amino acids, optionally substituted with a free hydroxyl, an amide, an imide or a sugar, said additional amino acids being independently selected from L-configuration or D-configuration and said additional amino acids capable of cyclizing the peptide by bridging between the N- and C- termini thereof; and

wherein X and Y form a dipeptide selected from the group consisting of Ser-Tyr and a dipeptide formed of naturally occurring amino acids or unnatural amino acids, said dipeptide resistant to cleavage; and

wherein X' and Y' form a dipeptide selected from the group consisting of Asn-Arg, and a dipeptide formed of naturally occurring amino acids or unnatural amino acids, said dipeptide resistant to cleavage.

Claims 2-72(Canceled).

73(Original). A composition comprising multiple peptides according to claim 1.

74(Original). The composition according to claim 73, comprising at least two peptides, wherein the second peptide is attached to any amino acid of the first peptide.

75(Original). The composition according to claim 74, wherein additional peptides are attached to any amino acid of the other peptides in the composition.

76(Original). The composition according to claim 73, comprising at least two peptides wherein the second or additional peptides is attached to a branched construct of the other peptides in the composition.

77-78(Canceled).

79(Original). A method of treating a mammalian infection comprising administering to a mammal having said infection an effective amount of a peptide of claim 1.

80(Canceled).

81(Currently Amended and Withdrawn). ~~The~~ A method for identifying pharmaceutical compounds comprising:

(i) performing a competitive assay with:

(a) a microorganism susceptible to a peptide of claim 1;

(b) a peptide of claim 1; and

(c) at least one test compound;

(ii) exposing (a) to (b) and (c); and

(iii) identifying said test compound which competitively displaces the binding of said peptide to a receptor on said microorganism.

82(Original). A pharmaceutical composition comprising one or more of the peptides of claim 1 in a pharmaceutically acceptable carrier.

83(Original). A pharmaceutical composition comprising one or more of the compositions of claim 73 in a pharmaceutically acceptable carrier.

84(Original). A composition according to claim 73, wherein R^2 of one said peptide is an alkanoic acid group and wherein an additional said peptide is linked to the same R^2 at the carboxyl terminus.

85(Currently Amended). A composition comprising multiple peptides of the formula R^1-Asp-Lys-Gly-X-Y-Leu-Pro-Arg-Pro-Thr-Pro-Pro-Arg-Pro-Ile-Tyr-X'-Y'-R^2 SEQ ID NO:1,

wherein said Thr is not glycosylated,

wherein R^1 is a moiety having a net positive charge;

wherein R^2 is selected from the group consisting of:

(a) a free hydroxyl, an amide, an imide, a sugar;

(b) a sequence of one or up to about 5 additional naturally occurring or unnatural amino acids, optionally substituted with a free hydroxyl, an amide, an imide or a sugar;

(c) a sequence of (b) wherein said additional amino acids cyclize the peptide by bridging between the N- and C-termini thereof; and

(d) a sequence of (b), wherein said additional amino acids link at least two said peptides;

wherein X and Y form a dipeptide selected from the group consisting of Ser-Tyr and a dipeptide formed of naturally occurring amino acids or unnatural amino acids, said dipeptide resistant to cleavage,

wherein X' and Y' form a dipeptide selected from the group consisting of Asn-Arg, and a dipeptide formed of naturally occurring amino acids or unnatural amino acids, said dipeptide resistant to cleavage.

86(Original). The composition according to claim 85, which is a multiple antigenic peptide.

87(Original). The peptide according to claim 1, which is fused to a second protein.

88(Original). A composition according to claim 85, wherein R^2 of one said peptide is an alkanoic acid group and wherein an additional said peptide is linked to the same R^2 at the carboxyl terminus.

89(New). The peptide according to claim 1, wherein R^1 is selected from the group consisting of:

(a) a straight chain, branched, cyclic or heterocyclic alkyl group;

(b) a straight chain, branched, cyclic or heterocyclic alkanoyl group;

(c) a positively charged reporter group;

(d) between 1 to 15 additional amino acids independently selected from the group consisting of L-configuration and D-configuration;

(e) an additional amino acid of (d) substituted by one or more of (a), (b), or (c); and

(f) a sequence of four to 15 additional amino acids capable of cyclizing the peptide by bridging between the N- and C-termini thereof.

90(New). The peptide according to claim 89, wherein said amino acids of (d) or (e) have been cyclized by the insertion into the structure of the amino acid or modifying sugars or imide.

91(New). The peptide according to claim 89, wherein said R^1 group (d) or (e) is selected from the additional amino acid residues D-Val-, Arg-Val-, Lys-Val-, Lys-Val-

Asp-Lys-Val- SEQ ID NO: 5, and -Arg-Pro-Pro-Thr-Pro-Arg-Pro-Leu-Lys-Val- SEQ ID NO: 3.

92(New). The peptide according to claim 89, wherein said R^1 group (d) or (e) is selected from the group consisting of Acetyl-Arg-Val-; Acetyl-Lys-Val-; and Acetyl-Lys-Val-Asp-Lys-Val- SEQ ID NO: 29.

93(New). The peptide according to claim 89, wherein said R^1 group (c) is biotin.

94(New). The peptide according to claim 89, wherein said R^1 group (c) is 5(6) carboxyfluorescein.

95(New). The peptide according to claim 89, wherein R^1 group (c) is radioactive.

96(New). The peptide according to claim 89, wherein R^1 group (d) or (e) is a spacer interposed between the N- terminus and C- terminus of said peptide, permitting cyclization of said peptide.

97(New). The peptide according to claim 96, wherein R^1 group (d) or (e) is -Arg-Pro-Pro-Thr-Pro-Arg-Pro-Leu-Lys-Val- SEQ ID NO: 3, said Val linked to the N-terminal Asp of said formula and the N-terminal amino acid of R^1 linked by a covalent bond to the C-terminal amino acid of R^2.

98(New). The peptide according to claim 1, wherein said R^1 group (a) is 1-aminocyclohexane carboxylic acid.

99(New). The peptide according to claim 1, wherein said R^1 group provides a detectable signal, optionally upon interaction with other compounds.

100(New). The peptide according to claim 1, wherein R^2 is the amide of β-acetyl-2,3-diamino propionic acid.

101(New). The peptide according to claim 1, wherein R^2 is a sequence of four to 15 additional amino acids capable of cyclizing the peptide by bridging between the N- and C- termini thereof.

102(New). The peptide according to claim 1, wherein said R^2 is an amino acid and can cyclize the peptide by attaching to the amino terminal amino acid.

103(New). The peptide according to claim 1, wherein R^2 is selected from the group consisting of D-Asn, L-Asn, Asp, and Asn-R^3, wherein R^3 is a sugar.

104(New). The peptide according to claim 103, wherein R^3 is selected from the group consisting of 2-acetamido-2-deoxyglucose and triacetyl 2-acetamido-2-deoxyglucose.

105(New). The peptide according to claim 1, wherein at least one amino acid is altered to its corresponding D amino acid.

106(New). The peptide according to claim 1, which is non-glycosylated.

107(New). The peptide according to claim 1, which is a cyclic peptide in which R^1, R^2, or a combination of R^1 and R^2 form an amino acid spacer of greater than 3 amino acid residues.

108(New). The peptide according to claim 107, wherein said spacer duplicates at least a portion of the peptide sequence of claim 1.

109(New). The peptide according to claim 1, wherein at least one conventional amide bond between two amino acids in said sequence is replaced with a non-cleavable bond.

110(New). The peptide according to claim 109, wherein said non-cleavable bond is a thio-amide bond or a reduced amide bond.

111(New). The peptide according to claim 1, wherein X-Y is Ser-Tyr.

112(New). The peptide according to claim 1, wherein X'-Y' is Asn-Arg.

113(New). The composition according to claim 73, comprising at least two said peptides, wherein at least one or more of said peptides is attached to a carrier.

114(New). The composition according to claim 73, comprising at least two peptides, wherein each additional peptide is covalently linked to R^2 of another peptide in the composition.

115(New). The composition according to claim 73, which comprises a multiple antigenic peptide.

116(New). The composition according to claim 115, wherein said multiple antigenic peptide comprises a β-alanine substituent on a poly-lysine core.

117(New). The composition according to claim 115, comprising at least four peptides.

118(New). A composition according to claim 73, wherein said amide of one of said peptides is the amide of β-acetyl-2,3-diamino propionic acid group and wherein an additional peptide is linked to said amide at the carboxyl terminus.

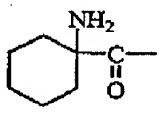
119(New). The composition according to claim 73, further comprising an amino acid or chemical compound spacer at the amino or carboxy termini of said peptides to link two or more peptides together.

120(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val-Asp-Lys-Val- SEQ ID NO: 29, X-Y is -Ser-Tyr-, X'-Y' is -Asn-Arg-, and R2 is Asn.

121(New). The peptide according to claim 1, wherein R1 is Acetyl-Arg-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn.

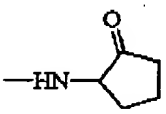
122(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn.

123(New). The peptide according to claim 1, wherein

R1 is 

, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn.

124(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val, X-Y- is Ser-Tyr, X'-Y' is Asn-Arg, and

R2 is 

125(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is NH-CH-CONH$_2$
|
CH_2-NH-$COCH_3$.

126(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn-2-acetamido-2-deoxyglucose.

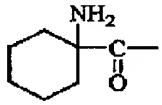
127(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn-triacetyl-2-acetamido-2-deoxyglucose

128(New). The peptide according to claim 1, wherein R1 is D-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is D-Asn.

129(New). The peptide according to claim 1, wherein R1 is Biotin-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn.

130(New). The peptide according to claim 1, wherein R1 is 5(6)-carboxyfluorescein-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn.

131(New). The peptide according to claim 1, wherein R1 is Acetyl-Lys-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asp.

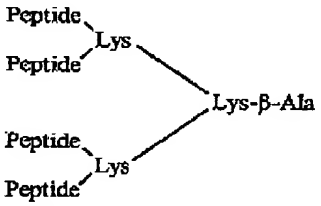
132(New). The peptide according to claim 1, wherein R1 is  , X-Y- is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is NH-CH-CONH$_2$
|
CH_2-NH-$COCH_3$.

133(New). The peptide according to claim 1, wherein R1 is Acetyl-Arg-Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is NH-CH-$CONH_2$
CH_2-NH-$COCH_3$

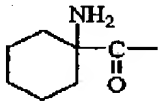
134(New). The peptide according to claim 1, wherein R1 is Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is NH-CH-$CONH_2$
CH_2-NH-$COCH_3$

135(New). The peptide according to claim 107, wherein R1 is Val, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn-Arg-Pro-Pro-Thr-Pro-Arg-Pro-Leu-Lys-, wherein the Lys group of R2 is bound to Val of R1.

136(New). The composition according to claim 117, comprising the structure

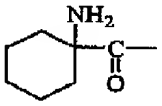


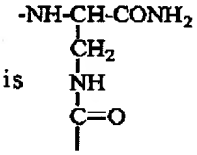
wherein each said peptide is of the formula R^1-Asp-Lys-Gly-X-Y-Leu-Pro-Arg-Pro-Thr-Pro-Pro-Arg-Pro-Ile-Tyr-X'-Y'-R^2 SEQ ID NO: 1, wherein:

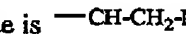
R1 is 

, X-Y is Ser-Tyr, X'-Y' is Asn-Arg, and R2 is Asn.

137(New). The composition according to claim 74, comprising two peptides of SEQ ID NO: 1 linked at their R2 moieties, wherein:

each R1 is  , each X-Y- is Ser-Tyr, each X'-Y' is Asn-Arg, and wherein

the R2 of one peptide is  ,

and the R2 of the second peptide is  .

138(New). The composition according to claim 136, wherein said peptide is produced synthetically or recombinantly.

139(New). The composition according to claim 136, wherein one or more of said peptides is a synthetic peptide fused to a second moiety, wherein said moiety enhances the bioavailability of said peptide.

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Applicants respectfully request entry of this paper which includes a re-submitted "Amendments to the Claims" section and consideration thereof.

The Director is hereby authorized to charge any deficiency in any fees due with the filing of this paper or credit any overpayment in any fees to our Deposit Account Number 08-3040.

Respectfully submitted,

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